



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,713	02/09/2004	Craig Jou Hawker	ARC920010100US2	3835
23980	7590	10/08/2004	EXAMINER	
REED & EBERLE LLP			CHACKO DAVIS, DABORAH	
800 MENLO AVENUE, SUITE 210			ART UNIT	
MENLO PARK, CA 94025			PAPER NUMBER	

1756

DATE MAILED: 10/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/775,713

Applicant(s)

HAWKER ET AL.

Examiner

Daborah Chacko-Davis

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7, and 11-64, are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent No. 6,107,357 (Hawker et al).

Hawker, in the abstract, in col 3, lines 63-67, in col 4, lines 1-9, in col 5, lines 63-67, in col 6, lines 1-37, in col 9, lines 7-19, discloses a method of preparing a crosslinked matrix comprising providing polymer molecules (silicon-containing polymer) having a plurality of crosslinkable groups (R^1-L-R^2) that undergo a irreversible intramolecular crosslinking reaction (no intermolecular crosslinking) when heated (activated) to a crosslinking temperature, heating the polymer molecules and crosslinking groups to the crosslinking temperature so as to form crosslinked particles (each polymer forms a corresponding crosslinked particle, R^1 is a functional group that binds to a porogen, and R^2 is a functional group that binds to the host polymer) (claims 1, and 44). Hawker, in col 5, lines 54-67, in col 6, lines 1-14, discloses that during crosslinking reaction (activation) the crosslinking occurs in an intramolecular manner (not intermolecular, i.e., the porogen is inert to intermolecular crosslinking, less than 10% intermolecular crosslinking is considered equivalent to no intermolecular crosslinking), wherein the crosslinking agent and the polymer forms a matrix of the

Art Unit: 1756

porogen, and the porogen (non reactive to intermolecular reaction) is defined as a discrete phase within a continuous phase (claims 2-3, and 45-46). Hawker, in col 10, lines 7-30, discloses that the polymer molecules and the crosslinking agents undergo intramolecular crosslinking reaction in a solvent to form the crosslinked particles in the solvent (randomly formed crosslinked particles) (claims 4, 36, and 50). Hawker, in col 9, line 7-13, in col 10, lines 6-25, discloses that the reaction mixture (crosslinking agents) is added to the solvent that is maintained at a higher temperature such that the temperature is sufficient to promote the intramolecular crosslinking (thermally activated crosslinkable groups, and thermally activated crosslinking) between the crosslinkable groups and the host polymer, present in the solvent, to form the polymeric matrix (claims 5-7, 47, 53-57, and 62). Hawker, in col 5, lines 63-65, in col 8, lines 22-24, and lines 63-67, in col 9, lines 1-6, discloses that the crosslinking agents and the polymer are activated by adding a chemical activating group (porogen with a reactive site) to the host polymer matrix (unreacted polymer and crosslinking groups present in the mixture prior to addition of porogen) in order to undergo intramolecular crosslinking, wherein the activating group is a free-radical initiator (claims 11-14, 59-60). Hawker, in col 10, lines 47-59, discloses that the polymeric matrix formed (irreversibly crosslinked host polymer and crosslinking agents) comprises cell pores (crosslinked particles) that are less than 10nm in diameter, and that the pore size is determined by the molecular weight of the polymer (i.e., the pore size can be varied by varying the molecular weight of the polymer) (claims 15-23). Hawker, in col 10, lines 51-61, discloses that the crosslinked particles in the polymeric matrix have a hydrodynamic volume of about 5% to 35%

Art Unit: 1756

(claims 24-27). Hawker, in col 4, lines 64-67, in col 5, lines 1-52, in col 6, lines 24-49, discloses that the polymer molecules (host polymer) are either linear or branched or block copolymers (claims 28-31). Hawker, in col 5, lines 50-53, and in col 6, lines 38-56, discloses that the host polymer comprise linked monomeric units such as organic polysilicas (claims 32, and 48). Hawker, in col 9, lines 13, discloses that the crosslinking agent (coupling agent) is directly bound to the polymer (monomeric unit) (claim 33). Hawker, in col 9, lines 30-67, discloses that the crosslinking agent is indirectly linked to the host polymer through a linking group (Linker, L) (claim 34). Hawker, in col 9, lines 20-24, discloses that the crosslinking groups include ethers (claims 35, and 49). Hawker, in col 9, lines 35-40, and lines 56-60, discloses that the polymer molecule (silicon containing polymer) includes a chemical moiety that is a functional group. Hawker, in col 9, lines 10-67, and in col 10, lines 1-5, discloses that the crosslinked particles (host polymer crosslinked with the crosslinking group) includes a chemical moiety (porogen) attached to one of the functional groups (R^1-L-R^2) (claims 39-41). Hawker, in col 10, lines 7-54, discloses that the polymeric matrix includes crosslinked particles (closed cell pores), and that the polymeric matrix (after crosslinking) is heated to the decomposition temperature of the matrix such that the crosslinked particles decompose (porogens volatilized) leaving voids in the matrix, resulting in the formation of a porous polymeric matrix (claims 42-43, 51-52, and 63-64). Hawker, in col 10, lines 12-16, discloses that the solution used for the crosslinking reaction has solid contents typically maintained between about 10 wt. % to about 60 wt. % (i.e., the solution inherently is dilute enough to promote intramolecular crosslinking

Art Unit: 1756

rather than intermolecular crosslinking) (claim 58). Hawker, in col 10, lines 7-10, discloses that the solvent used in the crosslinking reaction is N-methylpyrrolidone (claim 61).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8-10, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,107,357 (Hawker et al) in view of U. S. Patent 5,431,790 (Nesburn et al).

Hawker is discussed in paragraph no. 2.

The difference between the claims and Hawker is that Hawker does not disclose that the crosslinkable groups are photolytically activatable and that the activating process is carried out by irradiating the polymer molecule with either UV radiation or ionizing radiation or electron beam radiation (claims 8-9). Hawker does not disclose that the polymer solution is added to an already irradiated solvent to promote intramolecular crosslinking (claim 10).

Nesburn, in col 6, lines 1-5, and lines 27-49, and in col 7, lines 63-69, and in col 8, lines 14-42, discloses that photoactivatable crosslinking agents are crosslinked with polymers (intramolecular crosslinking) by exposing the solution of the crosslinking

Art Unit: 1756

agents and polymers to UV radiation or by performing crosslinking to the already UV-irradiated solution of the polymer and crosslinking agents to form the intramolecular crosslinked product.

Therefore, it would be obvious to a skilled artisan to modify Hawker by employing the method of exposing the crosslinking agents and polymer mixture to radiations in order to undergo intramolecular crosslinking as suggested by Nesburn because Nesburn, in col 6, lines 1-6, and lines 26-38, discloses that photoactivatable crosslinking reagents combined with polymers upon photoactivation produces molecularly highly crosslinked product that is usable as a bioadhesive that is non-toxic, biocompatible, with high bond strength, transparency and biodegradability.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For

Application/Control Number: 10/775,713

Page 7

Art Unit: 1756

more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

[Handwritten initials]

October 7, 2004.



**JOHN A. MCPHERSON
PRIMARY EXAMINER**